

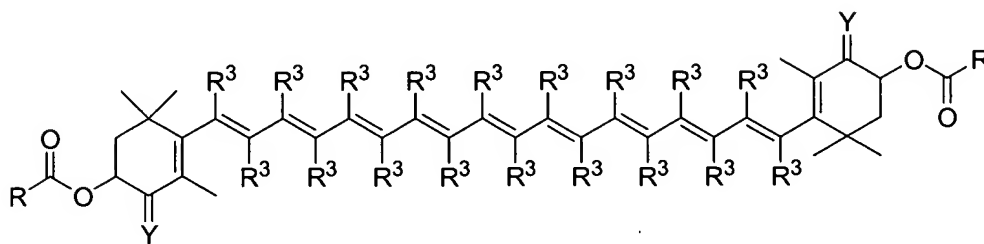
In the Claims:

Please amend the claims as follows.

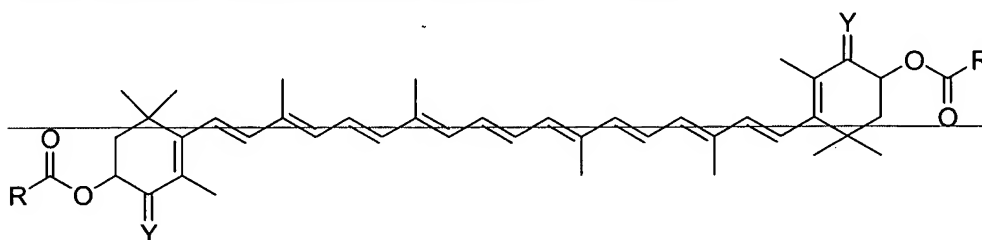
The following lists all claims and their status:

1-53 (canceled)

54. (presently amended) A chemical compound comprising a carotenoid derivative having the structure



where each R^3 is independently hydrogen or methyl;



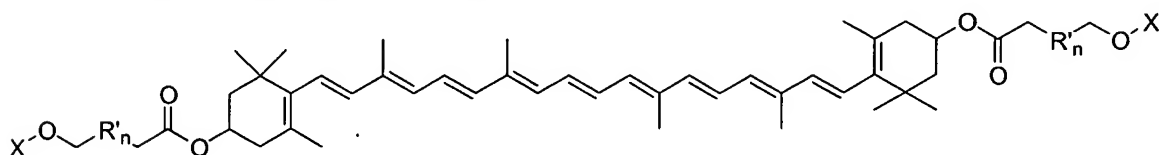
where each Y is independently O or H_2 ;

where each R is independently OR^1 or R^1 ;

where each R^1 is independently -alkyl- NR_3^+ , -aromatic- NR_3^+ , -alkyl- CO_2^- , -aromatic- CO_2^- , -amino acid- NH_3^+ , -phosphorylated amino acid- NH_3^+ , polyethylene glycol, dextran, H, alkyl, or aryl;

where each R^2 is independently H, alkyl, or aryl.

55. (original) The compound of claim 54, wherein the carotenoid derivative is at least partially water soluble.
56. (original) The compound of claim 54, wherein the cyclic ring further comprises at least one chiral center.
57. (original) The compound of claim 54, wherein the carotenoid derivative is a derivative of a naturally occurring carotenoid.
58. (currently amended) The compound of claim 54, wherein the carotenoid derivative is a derivative of a naturally occurring carotenoid, and wherein the naturally occurring carotenoid is ~~lycopene, lycophyll, lycopanthin, astaxanthin,~~ beta-carotene, lutein, zeaxanthin, or canthaxanthin.
59. (cancelled)
60. (cancelled)
61. (presently amended) The compound of claim 54, wherein the carotenoid derivative having the structure

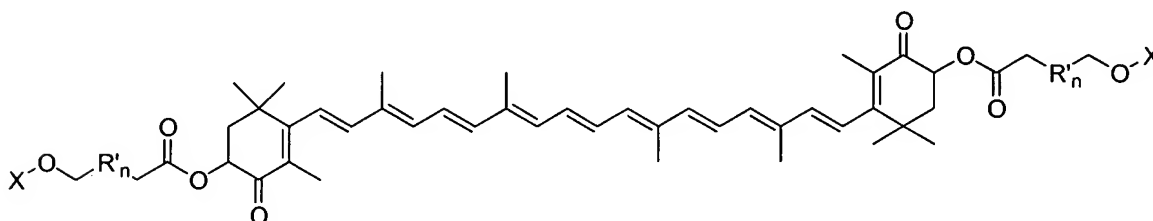


where each X is independently -alkyl-NR₃⁺NR₃²⁺, -aromatic-NR₃⁺NR₃²⁺, -alkyl-CO₂⁻, -aromatic-CO₂⁻, -amino acid-NH₃⁺, -phosphorylated amino acid-NH₃⁺, polyethylene glycol, dextran, H, alkyl, or aryl;

where each R' is independently -alkyl-O, alkyl, or aryl; and

where n is between ~~about~~ 0 and 12.

62. (presently amended) The compound of claim 54, wherein the carotenoid derivative having the structure

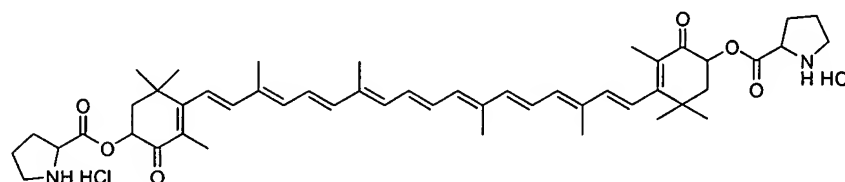


where each X is independently -alkyl-NR₃⁺NR₃²⁺, -aromatic-NR₃⁺NR₃²⁺, -alkyl-CO₂⁻, -aromatic-CO₂⁻, -amino acid-NH₃⁺, -phosphorylated amino acid-NH₃⁺, polyethylene glycol, dextran, H, alkyl, or aryl;

where each R' is independently -alkyl-O, alkyl, or aryl; and

where n is between ~~about~~ 0 and 12.

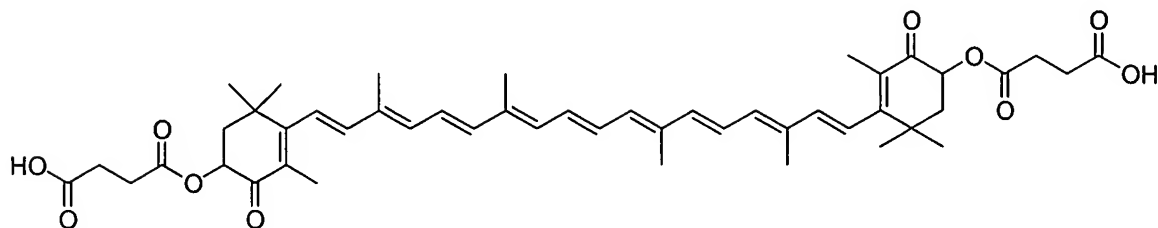
63. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



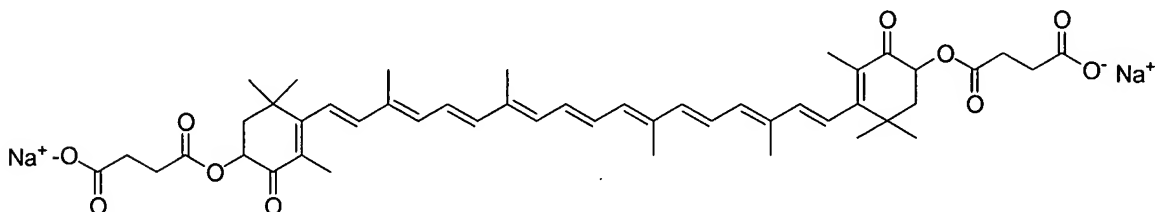
64. (cancelled)

65. (cancelled)

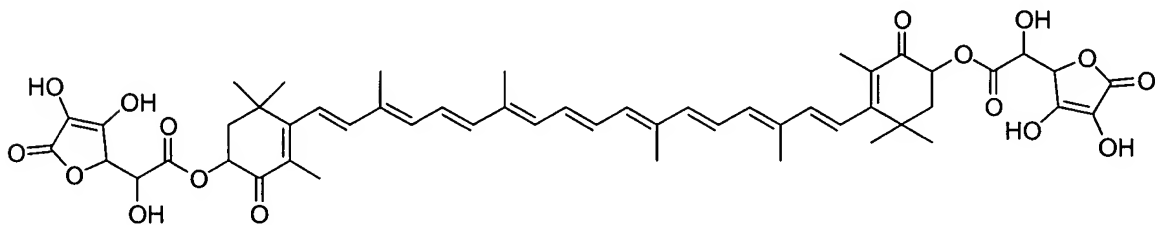
66. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



67. (original) The compound of claim 54, wherein the carotenoid derivative having the structure

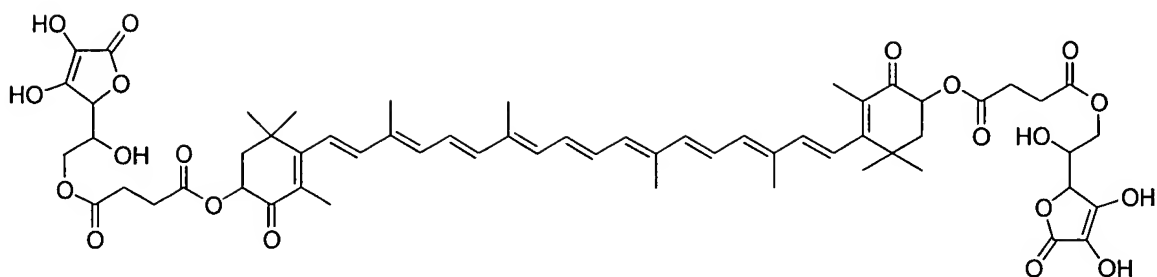


68. (original) The compound of claim 54, wherein the carotenoid derivative having the structure

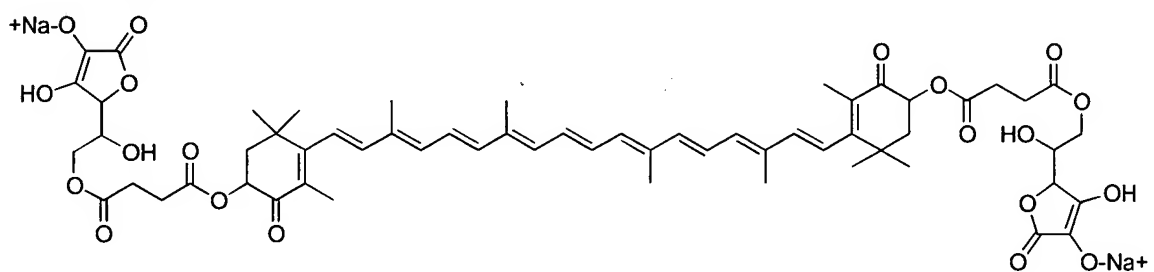


69. (cancelled)

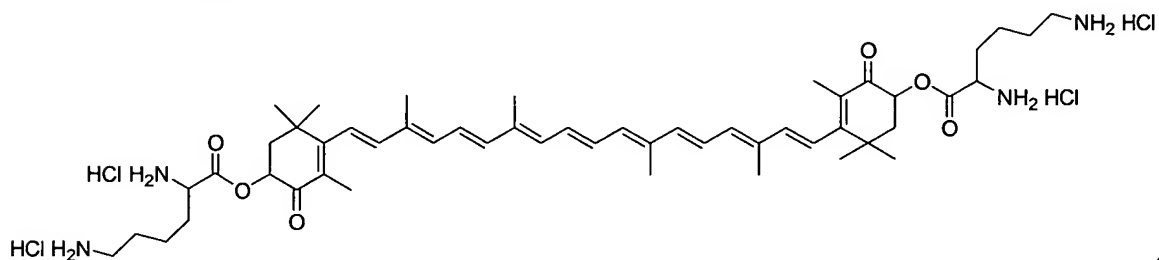
70. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



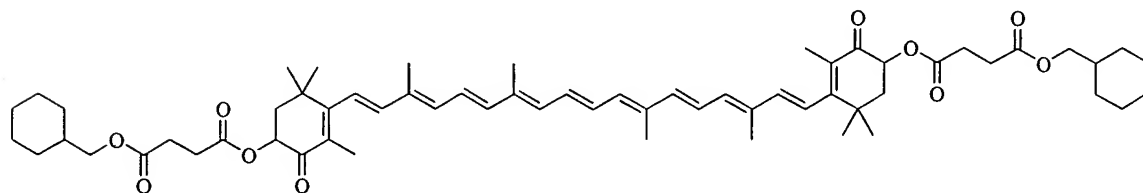
71. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



72. (original) The compound of claim 54, wherein the carotenoid derivative having the structure

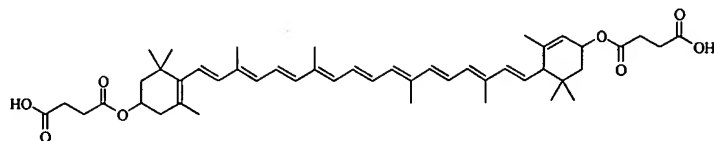


73. (original) The compound of claim 54, wherein the carotenoid derivative having the structure

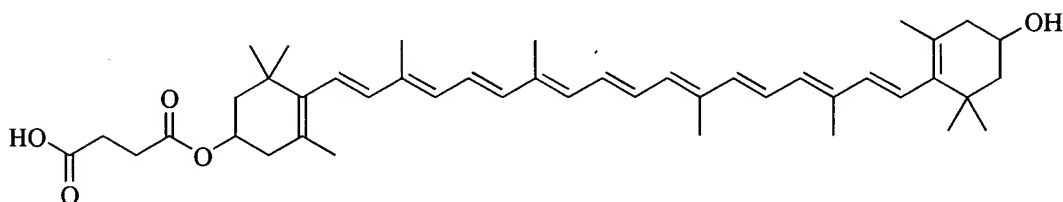


74. (cancelled)

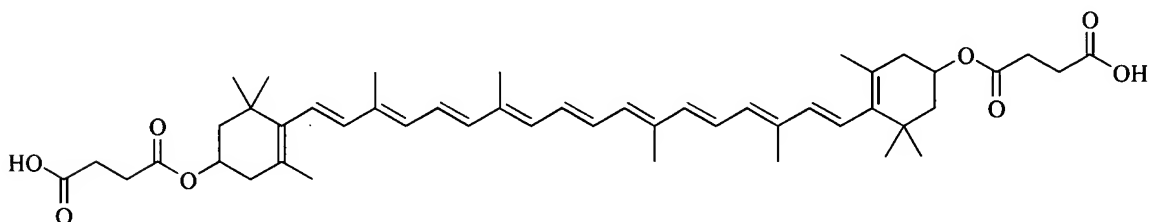
75. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



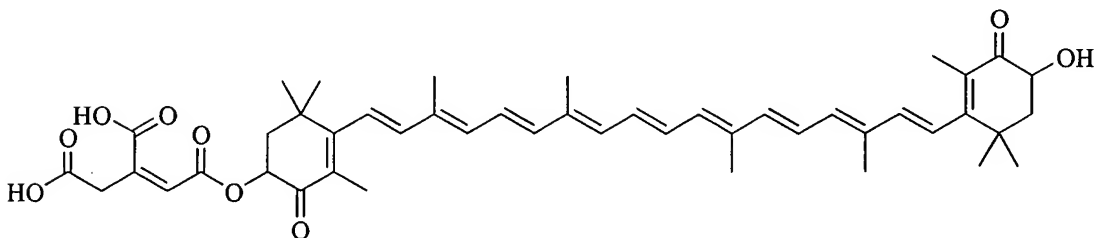
76. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



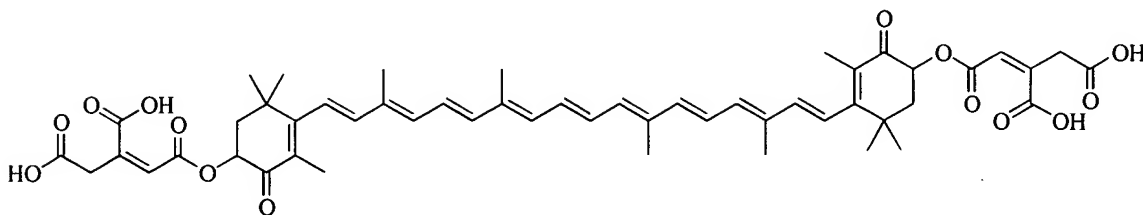
77. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



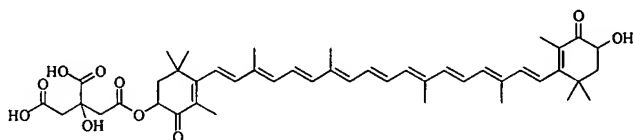
78. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



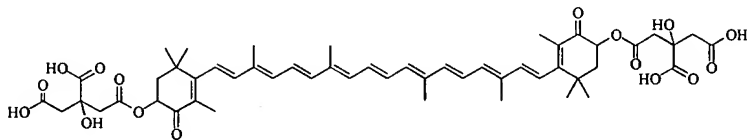
79. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



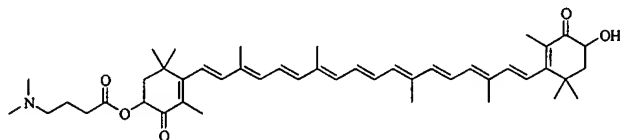
80. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



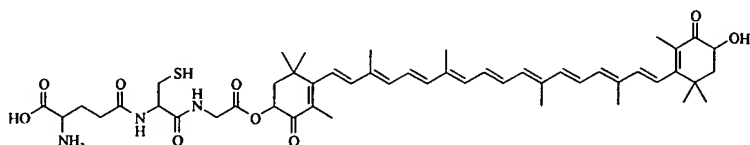
81. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



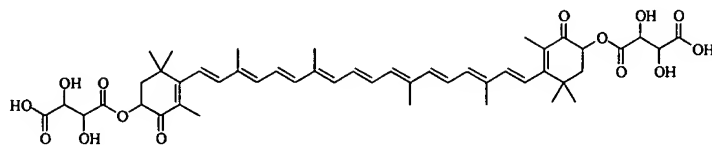
82. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



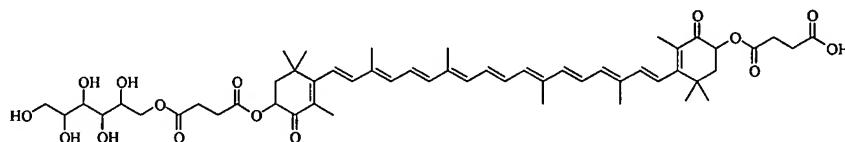
83. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



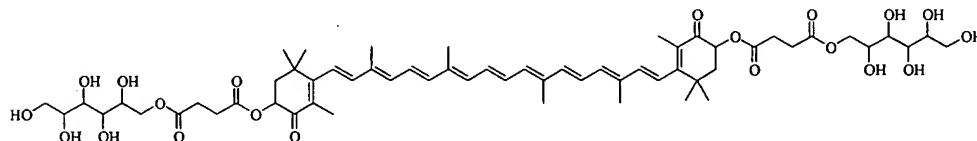
84. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



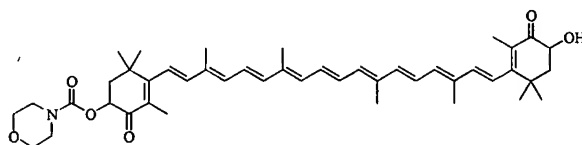
85. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



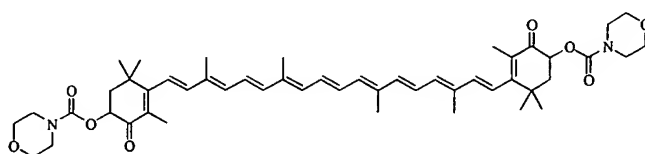
86. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



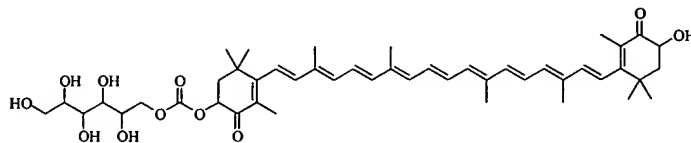
87. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



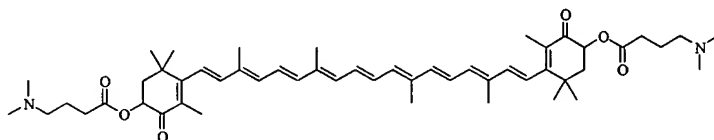
88. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



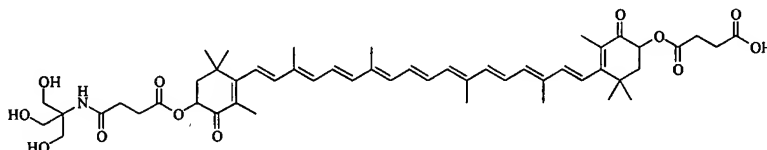
89. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



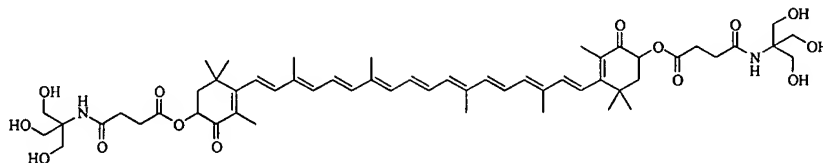
90. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



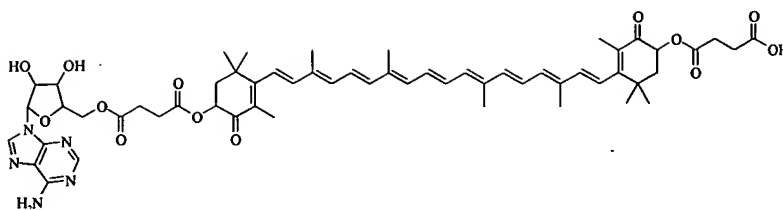
91. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



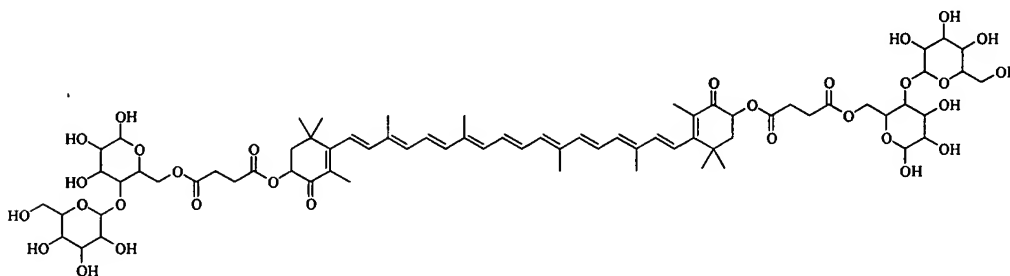
92. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



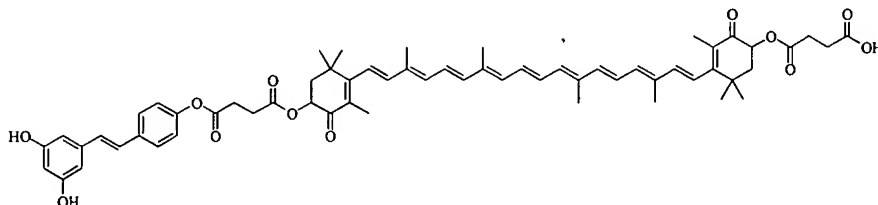
93. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



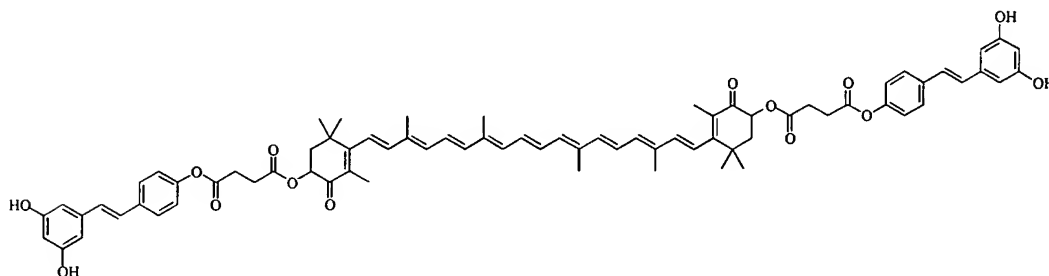
94. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



95. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



96. (original) The compound of claim 54, wherein the carotenoid derivative having the structure



97-1015 (canceled)

1018. (new) The compound of claim 54, wherein each R¹ is independently a co-antioxidant.